Engine and Auxiliary Systems

Edited by
Prof. Dr. A.K.M. Mohiuddin

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Table of Contents

Chapter 18

Thermodynamic Analysis of Combustion of CAMPRO CFE Engine – Part II: Com Analysis

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Introduction

The main objective of this part is to perform a thermodynamic analysis of comb CamPro CFE (Charged Forced Engine) engine to obtain its cylinder pressure data and s engine losses and its efficiency. The engine is a basic turbocharger engine which has a c of 1561cc and installed with a Borg Warner KP39 turbocharger. The bore and stroke dim for CamPro CFE are 76 mm and 86 mm respectively. The compression ratio of CamPro C being reduced to 9.5:1 compared to NA CamPro engine.

Reference combustion pressure data are collected from simulation result of the engine in POWER [1]. The air flow results obtained from the GT POWER is validated using FL simulation software. Then, the actual test is being conducted by using piezoelectric p sensor which is known as Kistler plug and the data is being recorded by using an analysis s known as OSIRIS. Once the data has been completely recorded, the data is being used calibrating a 32-bit torque base ECU torque model. In addition, the combustion pressure being used in creating a better CamPro CFE engine model by using simulation software [2]

Combustion Analysis

Experimental Procedure

The test was carried out on a single cylinder of the 1.6L CamPro CFE engine combustion pressure was measured by installing a Kistler spark plug with intergrat piezoelectric sensor into the engine cylinder #1. This type of pressure sensor enables the press measurement without drilling a hole. The kistler plug is simply fitted into the spark plug bo with a special mounting socket and it is connected to a charge amplifier. These analogue sign were converted into digital signals and fed to OSIRIS evolution II rack which works as a d acquisition system.